

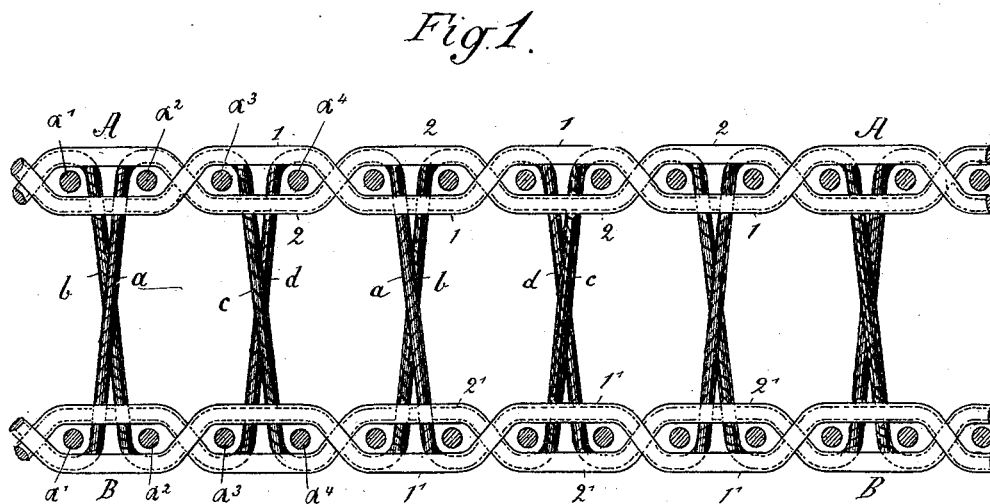
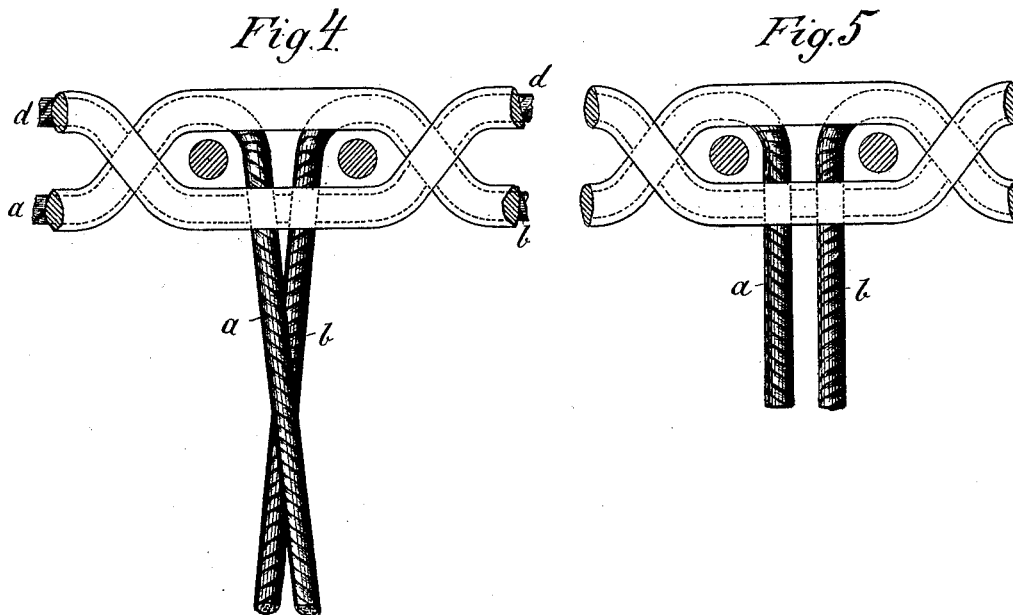
(No Model.)

2 Sheets—Sheet 1.

G. RATH.
WOVEN PLUSH FABRIC.

No. 422,447.

Patented Mar. 4, 1890.



Witnesses:
Hormann
R. Handcock

Inventor:
Georg Rath
by
Attent & R. D. Dinkler
attys

(No Model.)

2 Sheets—Sheet 2.

G. RATH.
WOVEN PLUSH FABRIC.

No. 422,447.

Patented Mar. 4, 1890.

Fig. 2.

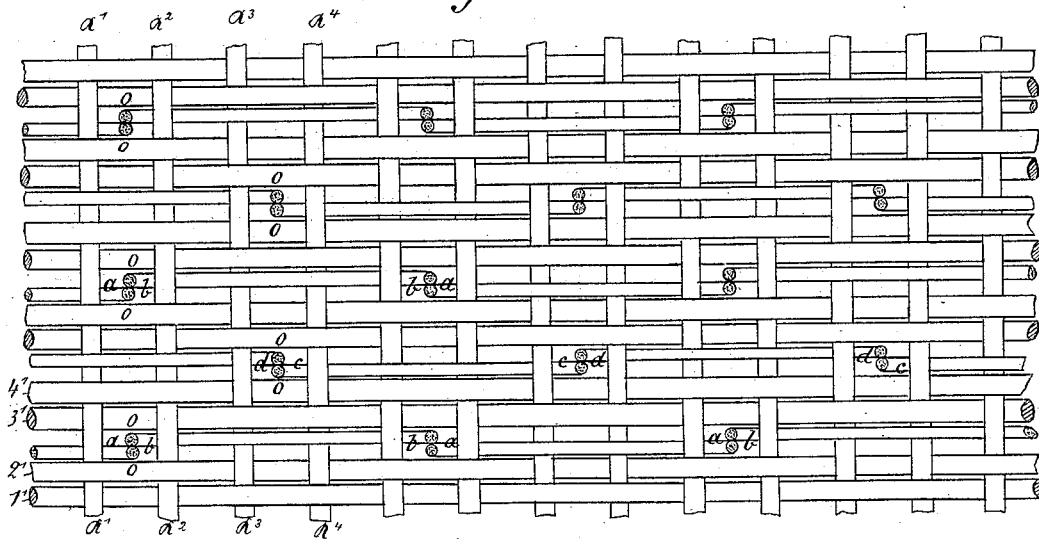
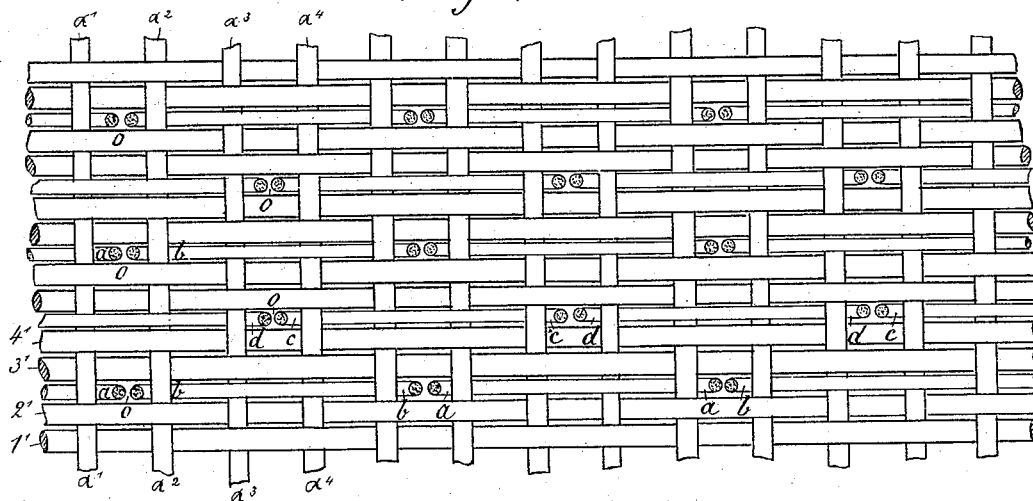


Fig. 3.



Witnesses:

Wm. M. Smith
R. R. Ransom

Inventor:

Georg Rath
by
Atk. & R. Winkler
attys.

UNITED STATES PATENT OFFICE.

GEORG RATH, OF ELBERFELD, PRUSSIA, GERMANY.

WOVEN PLUSH FABRIC.

SPECIFICATION forming part of Letters Patent No. 422,447, dated March 4, 1890.

Application filed October 18, 1888. Serial No. 288,510. (No specimens.)

To all whom it may concern:

Be it known that I, GEORG RATH, a subject of the King of Prussia, German Emperor, residing at Elberfeld, in the Kingdom of Prussia, German Empire, have invented certain new and useful Improvements in Woven Plush Fabrics, of which the following is a full and clear description.

My invention relates in particular to plushes which are woven double by power-looms, and resides particularly in the manner in which the pile-threads are woven into the grounds or backs, so that when the double cloth is cut apart the pile-threads stand upright, as is usual in hand-woven plushes, but which has not yet been accomplished in those woven by power-looms. The two important points in my invention and those by which I attain this result are, first, the manner in which the pile-threads are fastened into the grounds or backs, and, secondly, by spinning the pile-threads left and right hand, so that when two pile-threads are standing together woven in the same mesh the one is spun right while the other is spun left hand. The two neighboring threads will therefore have a tendency to twist away from each other and will thus stand close together and hold each other upright.

In order to make my invention more clear, I refer to the accompanying drawings, in which similar letters denote similar parts throughout the several views.

Figure 1 is a section of a double plush fabric on a line running parallel with the pile-threads, with the weft-threads in section. The weft-threads are in this figure, for the sake of clearness, drawn farther apart than is really the case. If they were drawn quite correctly, the pile-thread *b* would be compressed against pile-thread *a*, and the two would not be so easily distinguishable. Fig. 2 is a section through between the two grounds or backs in Fig. 1, showing the plush loose, just as it is shown in Fig. 1, for the sake of clearness. Fig. 3 shows the finished plush, the warp ground-threads being drawn in their proper position and with the pile-threads in the position which they occupy in the finished plush.

I employ three sets of threads—the warp ground-threads 1 2 1' 2', &c., the weft-threads *d'* *d*² *d*³ *d*⁴, &c., and the warp pile-threads *a b*

c d—and the manner in which they are woven together is as follows: The weft-threads *d'* *d*² *d*³ *d*⁴ run through the whole ground or back, both top and bottom. The warp ground-threads 1 2 in the back A and 1' 2' in the back B also run through the fabric at right angles to the weft-threads, warp-thread 1 passing over two weft-threads, Fig. 1, then under two alternately, and warp-thread 2 passing under the same two over which warp-thread 1 has passed and over those two under which 1 has passed, alternately, as may be clearly seen from the drawings. This is the same in both the backs A and B. The warp pile-threads are, however, common to both grounds A and B, and are shown partly in dotted lines in Fig. 1. Between each two pairs of warp ground-threads 1 2 or 1' 2' comes a warp pile-thread *a* or *b*. Pile-thread *b* passes over weft-thread *a'* of the upper ground A, then down to the under ground B, under the under ground weft-thread *a*², over the under ground weft-threads *d*³ *d*⁴, under the weft-thread next *d*⁴, and then passes to the top ground again, describes the same course in the upper ground as it has in the lower ground, and so on. Pile-thread *a* describes exactly the same course as pile-thread *b*, but alternates with that thread. As will be seen in Figs. 1 and 2, thread *a* passes over and under those weft-threads in the under ground which thread *b* has omitted, and then crosses thread *b* on its way to the upper ground or back again, being interwoven in those threads which *b* has omitted. The pile-threads *c* and *d* take exactly the same courses as *a* and *b*, but two warp ground-threads in each ground fabric lie between the threads *a b* and *c d*.

If in Fig. 1 the pile-threads *a b c d* were cut through, the section would be Fig. 2. These two figures, however, show the plush loose, for the sake of clearness, but as a matter of fact the threads lie quite closely together, as shown in Fig. 3.

In power-woven plushes the threads forming the pile are common to both grounds, while in all hand-woven plushes, as is well known, the pile-thread is left hanging out in the form of a loop, which is afterward cut through, and thus the two pile-threads stand opposite each other and consequently perfectly upright. Now, in power-woven double plushes

it is necessary that two threads *a* and *b* be used instead of one formed into a loop, and by my invention I bring these two threads to stand in the same manner as if they had been one thread formed into a loop.

As will be seen from Fig. 3, the two pile-threads *a* and *b* or *c* and *d* stand exactly opposite each other, and, being spun right and left, they tend to hold each other in a perfectly upright position. They are further held well in place by the two adjacent warp ground-threads, which pass—one on each side of the pile-threads—both at the same height, and the two weft-threads pass the pile-threads also at the same height on each side. This is an important point in my fabric, because, if the warp ground-thread which is on one side of the two pile-threads passes over the two weft-threads, and the warp ground-thread lying on the other side of the pile-threads passes under the weft-threads, the pile-threads will of course have a tendency to lean to the side where the supporting warp ground-thread lies lowest, which leaning of the pile-threads spoils the

whole appearance of the plush. From this it will be seen that I have by my invention eliminated the disadvantages accruing up to the present to power-woven plushes and have succeeded in producing a power-woven plush having all the advantages of those woven by hand.

Having thus fully described and ascertained the nature of my invention, I declare that what I claim, and desire to secure by Letters Patent of the United States, is—

A plush fabric having the cut end of each two pile-threads lying next to one another or in line and having on two sides thereof warp-threads lying at equal heights, and on the other two sides weft-threads also lying at equal heights, the two pile-threads being spun in opposite direction.

In witness whereof I have hereunto set my hand in presence of two witnesses.

GEORG RATH.

Witnesses:

EWALD SCHWACHTENBERG,
JULIUS RATH.